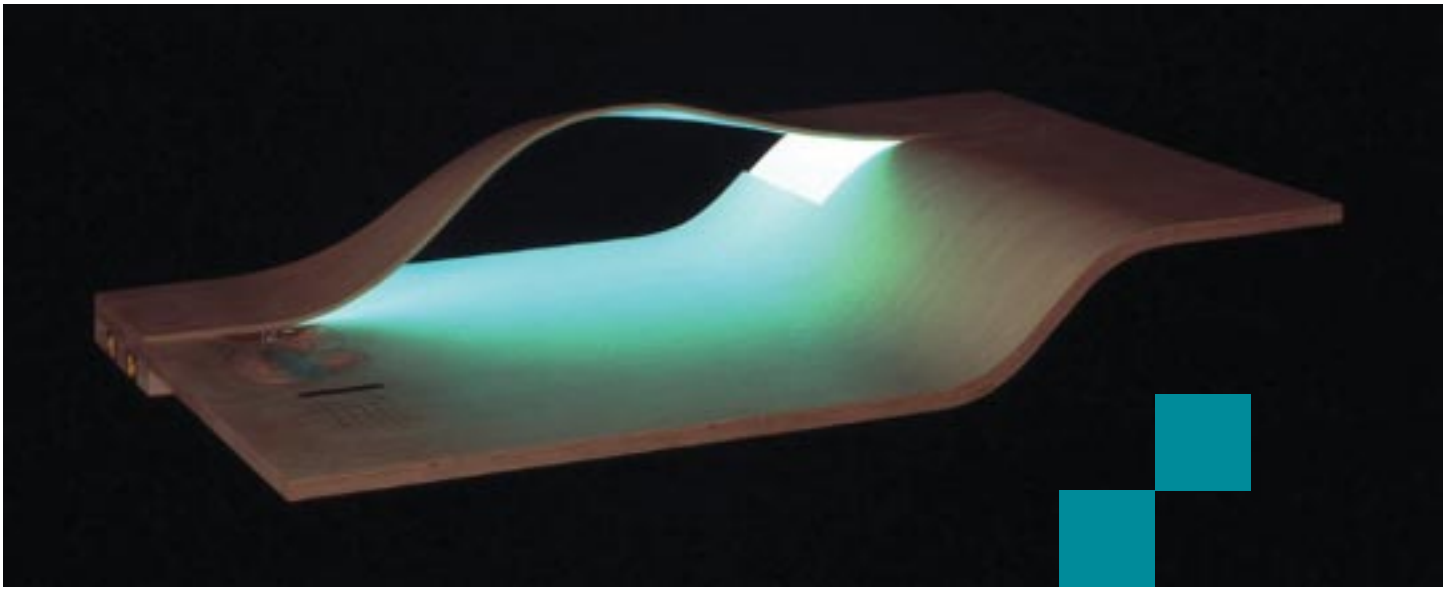
Electroluminescent Plywood Desk

The fusion of furniture, lighting, information access, and display

Research that Works!

Buildings Research and Development

U.S. Department of Energy



The light color, intensity, and other digital functions of the desk are controlled by touching a Palm Landscape of shaped wood, designed to accommodate the human hand.

Flexible circuits in the plywood conduct low voltage electricity, information, and solid state illumination. Calculators and digital tools embedded into the surface are activated by touching the wood.

Luminous Plywood

The EL Plywood Desk is a luminous, smart plywood surface that merges lighting with information access and display. The EL Desk is one of many possible applications for energy efficient, smart surfaces that combine the benefits of affordable architectural materials, electrical infrastructure, and furniture.

The design uses the layered construction of plywood to integrate sheets of energy efficient, ultra-thin electroluminescent (EL) film in the manufacturing process. EL technology creates a cool light source from flexible polymer films coated with luminescent phosphors that give off light when excited by an electric current. EL and organic light emitting diodes (OLEDs) are produced by taking the natural phenomenon of phosphorescence found in many fish, insects, and plants and electrifying it.

The energy efficiency, long life, durability, and cool temperature of EL film offer new ways to organize, distribute, and deliver light when integrated within materials. As luminous solid state surfaces replace discrete light fixtures, the infrastructure of artificial lighting merges with information access and display. When light intensity, location, and color can be controlled by computer, architectural materials become dynamic media.

Electroluminescent light can be generated in many colors, including shades of white. By varying the electrical drive current, the light color can be controlled and customized by the user.

Solid state circuitry is built into the desk, including Desk Drive™ computing power as well as data and information ports.

Smart Lighting Applications

The electroluminescent (EL) thin film technology featured in the EL Plywood Desk is one of many solid state semi-conductor technologies being researched today. The development of affordable active matrix large area light emitting polymers (LEPs) and organic light emitting diodes (OLEDs) will enable a next wave of smart lighting features for architectural applications.

Solid state technologies offer substantial energy savings in architectural applications where light and information can be integrated in floors, walls, ceilings and furniture. DOE is working to advance the research and deployment of this promising technology.

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The EL Plywood Desk Design

The EL Plywood Desk was designed by Sheila Kennedy, a Principal of Kennedy & Violich Architecture, a nationally recognized leader in the invention of new applications for solid state technologies. Developed with support from the U.S. Department of Energy (DOE) and engineering assistance from Novatech, Inc., the desk was selected for public exhibition at the Cooper Hewitt National Design Museum as a part of the exhibit, *SKIN: Surface, Substance and Structure*.